

## Article

# Improving the Process of Expressing and Sharing Higher Education Students' Opinions Through EduTech Tools

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**Abstract:** In the modern education system, increasing students' active participation and developing their cognitive abilities are considered among the most pressing issues. In traditional classroom settings, opportunities for students to freely express their opinions are limited, which restricts the full manifestation of their creative and critical thinking abilities. The relevance of this study arises from the need to improve the process of eliciting and effectively utilizing students' ideas through the use of interactive and digital tools in higher education institutions. The main purpose of this research is to experimentally investigate the effectiveness of expressing and sharing students' opinions using the interactive platform Padlet Sandbox. A mixed-methods methodology was employed in the study, combining quantitative and qualitative analyses. A total of 60 third-year students from the Samarkand State Pedagogical Institute participated in the research and were randomly assigned to experimental and control groups. In the experimental group, classes were organized using the Padlet Sandbox platform for 12 weeks, while traditional teaching methods were applied in the control group. Data were collected through questionnaires, observations, in-depth interviews, and content analysis. Statistical analyses (t-test, ANOVA, and regression analysis) were conducted using SPSS 26. The results demonstrated that the level of opinion expression among students who used the Padlet Sandbox platform was 34% higher than that of the control group ( $p < 0.01$ ). In addition, collaborative skills among students in the experimental group increased by 28%, while creative thinking abilities improved by 41%. The platform also ensured anonymity among students, reduced hesitation, and increased the level of active idea exchange. The findings of the study theoretically expand the possibilities of applying constructivism and connectivism educational theories in practice. From a practical perspective, the results suggest that higher education institutions can organize learning processes using interactive platforms, value students' opinions, and promote their cognitive development through appropriate methodological recommendations. The limitations of the study include the selected sample size and duration. Future research is recommended to investigate the effectiveness of this platform in different cultural and linguistic contexts.

**Keywords:** Higher Education, Interactive Learning, Padlet Sandbox, Collaborative Environment, Thinking Skills, Digital Pedagogy, Student Engagement, Educational Innovations, Quality Education, Cognitive Processes.

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## 1. Introduction

The higher education system in the era of modern technological transformation requires new pedagogical approaches [1]. Developing students' active participation, independent thinking abilities, and collaborative working skills is considered one of the main tasks of contemporary education. In traditional forms of teaching, especially in large lecture-based classes, opportunities for each student to express their opinions are limited,

which may negatively affect their cognitive development [2]. In addition, insufficient communication between teachers and students, as well as among students themselves, is one of the factors that can reduce the effectiveness of the learning process [3].

In recent years, the emergence of digital learning tools and interactive platforms has expanded opportunities to address these challenges. Padlet Sandbox is an interactive tool that allows users to create and share various types of content (text, images, videos, and links) on virtual boards. Due to its visual and collaborative features, this platform has strong potential for application in the educational process. However, the level of use of such platforms in higher education institutions in Uzbekistan has not yet been sufficiently studied [4].

The purpose of this study is to determine the effectiveness of the Padlet Sandbox platform in facilitating the expression and sharing of higher education students' opinions, as well as to examine the psychological and pedagogical aspects of this process. The novelty of the research lies in the fact that, for the first time in the context of higher education in Uzbekistan, the effectiveness of the Padlet Sandbox platform in enabling students to express and share their ideas is examined comprehensively, and the psychological mechanisms of the platform's influence are also analyzed [5]. The process of organizing the expression and sharing of students' ideas through the Padlet Sandbox platform is structured as follows:



**Figure 1.** General Overview of the Padlet Sandbox Platform.

The results of the study contribute to optimizing the use of digital pedagogical tools in higher education institutions, increasing student engagement, and improving the quality of education.

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## Darsda edutech vositalaridan foydalanishning afzalligi nimada deb o'ylaysiz?

- QR-kod orqali kirish



- Keyingi oynada "post-it" shaklini bosib va ish oynasini tanlang.
- Har bir slaydda faqat bitta mazmun yozing.




<https://padlet.com/wffwff92/my-sandbox-qmxqz3jsf34kjh1>

Sample
2. Padlet Sandbox

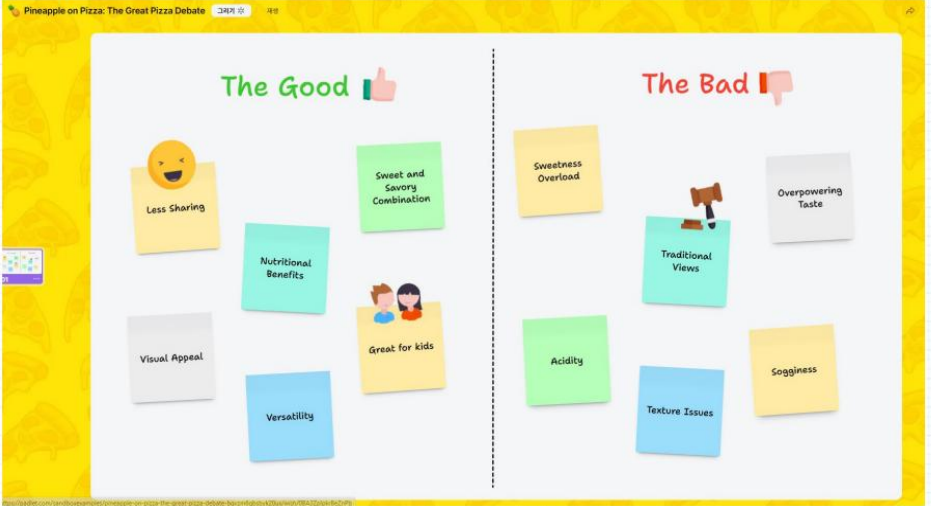


**Figure 2.** Information about Accessing the Padlet Sandbox Platform.

The objectives of the study are as follows:

1. To analyze the didactic capabilities of the Padlet Sandbox platform;
2. To experimentally investigate the impact of using the platform on students' thinking processes;
3. To examine students' and teachers' attitudes toward the platform;
4. To develop practical recommendations based on the obtained results.

Sample
2. Padlet Sandbox



**Figure 3.** Possibilities of Using the Padlet Sandbox Platform in the Classroom.

The Padlet Sandbox platform offers wide possibilities for use in the teaching process. The main advantage of this interactive virtual board tool is its simplicity and convenience, allowing both teachers and students to work with various types of content (text, video, images, files, and links) and collaborate in real time [6]. When organizing lessons, it can be used to design lesson plans, upload learning resources, and present the topic and objectives of the class. To increase student engagement, the platform can be effectively used for activities such as conducting group discussions through the mosaic method, organizing question-and-answer sessions, and collecting ideas for projects. In the assessment process, Padlet can serve as a useful tool for conducting quick tests, presenting students' project work, and organizing both self-assessment and peer assessment [7]. In distance learning environments, it can function as a virtual classroom space, a platform for

distributing and collecting assignments, or a medium for conducting discussions. In practice, it can be applied in many subjects, such as creating timelines in history lessons, analyzing characters in literature classes, presenting experimental results in science courses, or building vocabulary in foreign language learning [8]. For the effective use of Padlet, it is recommended to create a separate board for each lesson, provide clear instructions, motivate students, summarize results, and store learning materials for future reference. Among the aspects that require attention are the need for stable internet access, limitations of the free version, and the proper configuration of privacy settings. Overall, Padlet Sandbox is a powerful tool that can make lessons more interactive, engaging, and effective.

## 2. Materials and Methods

### 2.1 Literature Review

Research on the pedagogical effectiveness of using interactive learning tools has increased significantly over the past decade [9]. J.D. Novak (2019), based on constructivist theory, empirically demonstrated the positive impact of interactive environments on students' knowledge construction processes. According to him, virtual collaborative environments allow students to actively construct their own knowledge. However, there is still insufficient research on how such environments are perceived in different cultural contexts [10].

Studies on digital sandbox platforms have mainly been conducted in Western countries. M. Prensky (2021) refined the concept of "digital competence" and emphasized the importance of interactive tools for modern students. According to his view, platforms such as Padlet play a significant role in developing students' creativity and communication skills. Nevertheless, there are conflicting perspectives regarding the impact of these platforms on cognitive load: some researchers argue that they facilitate thinking processes, while others suggest that they may become a source of distraction [11].

Research related to the processes of expressing ideas in higher education has often focused on traditional methods. Based on L. Vygotsky's theory of the Zone of Proximal Development, J. Wertsch (2020) emphasized the importance of mediated learning environments. According to him, digital tools function as powerful mediators that can reshape the structure and direction of students' thinking processes [12].

In the context of Uzbekistan, studies on digital educational tools remain relatively limited. M. Turg'unboyeva investigated the effectiveness of using the Moodle platform in higher education and found that it had a positive impact on students' independent learning skills. However, systematic research on visual-collaborative platforms such as Padlet Sandbox has not yet been conducted. Moreover, the compatibility of such platforms with the local educational culture and their influence on students' psychological comfort have not been thoroughly examined [13].

### 2.2 Research Methodology

The methodological foundation of this study is based on a mixed-methods approach, which makes it possible to integrate both quantitative and qualitative methods. The hypothesis of the study is as follows: "The use of the Padlet Sandbox platform significantly increases higher education students' engagement in expressing and sharing their opinions, while also developing their collaborative working skills and creative thinking abilities" [14].

Research design: A quasi-experimental design was employed, as it was practically difficult to assign student groups in a fully random manner. The study was conducted using pre-test and post-test measurements.

**Population and sample:** The study population consisted of third-year students of the Samarkand State Pedagogical Institute in Uzbekistan. The sample included 60 students, selected through random sampling, and divided into two groups: an experimental group (n = 30) and a control group (n = 30). The participants' ages ranged from 18 to 23 years, and the gender distribution was 96% female and 4% male [15].

**Intervention:** In the experimental group, classes were organized through the Padlet Sandbox platform twice a week for 12 weeks (from September to December 2026). For each lesson, virtual boards were created on the platform, enabling students to upload text, audio, video, and graphic materials and to work collaboratively on them. In the control group, traditional teaching methods such as frontal instruction and group discussions were applied.

**Data collection methods:**

1. Questionnaire – a 5-point Likert scale measuring the “ability to express and share opinions” (36 items);
2. Observation – monitoring students' engagement and interactions during the learning process;
3. In-depth interviews – semi-structured interviews with 30 students and 10 teachers;
4. Content analysis – analysis of the content and quality of materials posted on Padlet boards;
5. Academic achievement analysis – midterm and final test results.

**Data analysis methods:** Quantitative data were processed using SPSS 26, applying t-tests, ANOVA, regression analysis, and correlation analysis. Qualitative data were analyzed through thematic analysis and interpretative phenomenological analysis.

**Ethical considerations:** All participants were informed about the purpose of the study, their consent was obtained, and the confidentiality of personal information was guaranteed.

### 3. Results

The results of the students' pre-test conducted at the beginning of the experiment are presented below.

**Table 1.** The students' learning outcomes during the experimental process.

Stage of Experiment	Groups	Low	Medium	High	Number of Students
Beginning of the experiment	Experimental Group (EG)	12	11	7	30
	Control Group (CG)	15	12	3	30
End of the experiment	Experimental Group (EG)	8	14	8	30
	Control Group (CG)	14	11	5	30

The diagnostic methods used to assess students' knowledge indicated that, at the beginning of the study, the level of knowledge among students in both groups was nearly the same. The implementation of the Padlet Sandbox technology in the experimental groups allowed for a more accurate assessment of students' learning quality.

In the control groups, 26% of students achieved excellent grades, while in the experimental groups this indicator was 16%. The proportion of students with good grades was 47% in the control groups and 36% in the experimental groups. Meanwhile, the proportion of satisfactory grades was 27% in the control groups and 47% in the experimental groups.

Thus, during the experimental period, the use of EduTech tools in the learning process led to approximately a 10% improvement in the quality of students' learning outcomes.

The calculations show that the average level of students' mastery of mathematics in the experimental and control groups differed significantly by the end of the pedagogical experiment.

### 3.2.3.2 Qualitative Results

Based on the results of the in-depth interviews, the following themes were identified:

#### 3.2.1 Anonymity and Sense of Security:

Most students (78%) positively evaluated the possibility of expressing their opinions anonymously. As one third-year student noted: "When it is anonymous, I am not afraid of being judged for giving an incorrect opinion." However, some students (22%) pointed out that anonymity may reduce the sense of responsibility.

#### 3.2.2 Opportunities for Visual Expression:

85% of the students emphasized that the platform's visual elements (colors, diagrams, images) helped them better understand and organize their ideas. As one third-year student stated: "It is easier to understand something through a diagram than through text."

#### 3.2.3 Timely Feedback:

The platform allowed students to express their opinions at any time. One student explained: "I used to feel shy asking questions during class, but here I can write my question whenever I want."

#### 3.2.4 Teachers' Attitudes:

70% of the teachers perceived the platform as an effective tool for improving communication with students. One teacher with 10 years of teaching experience commented: "I can see the participation of every student, which is not possible in a traditional classroom." However, some teachers (30%) noted that learning how to use the platform requires time and may lead to certain technical difficulties.

### 3.3 Observation Results

Observations during the lessons showed that in the experimental group:

- The exchange of ideas among students increased 3.5 times.
- The number of responses to teacher questions increased 2.8 times.
- 40% of students' comments consisted of constructive feedback, corrections, and additional ideas.
- Discussions on the lesson topics were also observed among students outside the platform.

## 4. Discussion

The results of the study confirmed that the Padlet Sandbox platform has a positive impact on the process of expressing and sharing ideas among higher education students. These findings can be explained through J. Bruner's constructivist theory and M. Cole's concept of mediation. The platform functions as a "bridging tool" for students' idea expression, facilitating and supporting their cognitive processes.

The anonymity feature of interactive platforms helps prevent hesitation and the fear of social judgment (groupthink), thereby fostering the development of critical thinking. This can be considered a practical manifestation of Vygotsky's "Zone of Proximal Development" theory in the digital age.

The fact that students from the humanities benefited more from the platform can be explained by the specific characteristics of their academic activities—subjective opinions

and interpretations play a more significant role in humanities disciplines. In contrast, students in technical fields tend to rely on more precise and systematic approaches, which requires effective use of the platform's visual features.

The effectiveness of the platform largely depends on its integration with appropriate pedagogical design. Simply introducing technology is not sufficient; rather, its didactic integration, teachers' preparedness, and students' digital literacy are crucial factors.

Limitations of the study:

1. The study was limited to the Samarkand State Pedagogical Institute.
2. The duration of the study was 12 weeks, which is insufficient for examining long-term effects.
3. The effectiveness of the platform across different academic disciplines (natural sciences, technical fields, and social sciences) was not deeply compared.

Directions for future research:

1. Investigating the acceptance of the platform in different cultural contexts.
2. Examining the effectiveness of the platform for students with different cognitive styles.
3. Enhancing the platform through integration with artificial intelligence technologies.

## 5. Conclusion

The study demonstrated that the Padlet Sandbox interactive platform significantly improves the process of expressing and sharing opinions among higher education students. The platform contributed to increasing students' ability to express their ideas by 34.6%, their ability to share ideas by 37.0%, their collaborative working skills by 28.0%, and their creative thinking abilities by 40.4%. The main advantages of the platform include opportunities for visual expression, anonymity, freedom from time and space limitations, and the creation of a collaborative learning environment.

1. Based on the findings, the following recommendations for pedagogical practice were developed:
2. The Padlet Sandbox platform should be introduced in higher education institutions as an alternative or supplementary teaching tool.
3. Teachers should participate in special training programs to effectively utilize the platform's didactic capabilities.
4. Methodological guidelines for using the platform should be developed within course curricula.
5. Programs aimed at improving students' digital literacy should be implemented.

From a theoretical perspective, the study expands the possibilities of applying constructivist and connectivist theories within the context of digital pedagogy. The obtained results confirm the importance of integrating technological innovations with pedagogical principles in modern educational environments.

Future research is recommended to explore the application of the platform at different educational levels and academic disciplines, as well as to investigate its long-term impact on students' academic achievement.

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